

***Bankesia desplatsella* Nel, 1999 (Lepidoptera, Psychidae): a species new to the Italian fauna**

STEFANO SCALERCIO¹, EDGARDO BERTACCINI²

1 *Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria (CREA), Unità di Ricerca per la Selvicoltura in Ambiente Mediterraneo, Rende (CS), Italy; stefano.scalercio@crea.gov.it*

2 *Via del Canale 24, 47010 Roncadello (FC), Italy*

<http://zoobank.org/02CDE23F-0662-4CCA-949D-A693F7D22282>

Received 7 December 2016; accepted 7 April 2017; published: 13 June 2017

Subject Editor: Jadranka Rota.

Abstract. *Bankesia desplatsella* Nel, 1999, is recorded here as new to the Italian fauna from specimens collected in the Calabria and Abruzzi regions. We provide the first description of the larval case, putatively belonging to this species, add details to our knowledge of the species' ecology, and analyse DNA barcodes of specimens from central and southern Italy. The female remains unknown.

Introduction

Four species of the genus *Bankesia* Tutt, 1899 (Psychidae, Taleporiinae) are distributed in the West Palaearctic (Sobczyk 2011). Three of them are known from Europe: *B. montanella* Walsingham, 1899 from Corsica, France; *B. desplatsella* Nel, 1999, from Bouches-du Rhône, France; and *B. conspurcatella* (Zeller, 1850) occurring in Belgium, Denmark, France, Germany, Italy, the Netherlands, Portugal, Spain, and the United Kingdom (Sobczyk 2011). Only *B. conspurcatella* has been reported in literature from Italy. It was described from Tuscany and has also been recorded from Piedmont, Liguria, Veneto, Emilia, Romagna, Abruzzi, Campania, Molise, Puglia, Basilicata, Calabria, and Sicily (Bertaccini 2010; Weidlich 2015). The males of this species fly early in the morning from late January to early May (Scalercio 2009; Bertaccini 2010; Weidlich 2015).

On 12 September 2013, a male specimen, initially attributed to *T. defoliella* Constant, 1896, which is known to fly at this time of the year, was collected in the Sila National Park, Calabria, Italy. After comparison with *T. defoliella* specimens deposited in the collection of the Unità di Ricerca per la Selvicoltura in Ambiente Mediterraneo, Italy, it was evident that the specimen belonged to a different species.

The authors searched through their collections for other specimens belonging to this unidentified species. They found 14 males identical to the one collected in the Sila National Park misidentified within a series of *T. defoliella* deposited in the Bertaccini private collection and collected in Abruzzi, Italy. Very few Taleporiinae species fly in the autumn, these being: *T. defoliella*, *T. autumnella* (Rebel, 1919), *T. henderickxi* Arnscheid, 2016 and *B. desplatsella*. After a study of literature available to the authors on autumnal Taleporiinae species (Constant 1896; Rebel 1919; Nel 1999; Hattenschwiler and Scalercio 2003; Arnscheid 2016), and after the examination of the male

genitalia of *T. autumnella* deposited in the Museum Witt, München, Germany, we identified our specimens as belonging to *Bankesia desplatsella*, a species new to the Italian fauna and, until now, considered endemic to France as it has not been recorded from other localities since its description based on two males.

The attribution of this species to the genus *Bankesia* is uncertain. In fact, due to the morphology of the male genitalia and especially because of the ciliation of the male antenna reported also in the original description, this species probably belongs to the genus *Pseudobankesia* Meier, 1963 or *Taleporia* Hübner, 1825 (Arnscheid, pers. comm.). Nevertheless, in this paper we use the original designation and await further studies to resolve the generic placement.

The first Italian male of this species was collected by chance in Calabria in the morning of 12.ix. 2013 on a wall of a building in the Centro Visita del Cupone (39°23.10'N; 16°32.97'E) of the Sila National Park, Italy. This site is near an artificial lake at ca. 1170 m a.s.l., in a forest mainly composed of Calabrian black pines (*Pinus nigra calabrica* (Loud.) Cesca and Peruzzi, Pinaceae). In the following years, we searched for males, females, and larval cases around the same site but without success. This specimen is housed in the Lepidoptera collection of the Unità di Ricerca per la Selvicoltura in Ambiente Mediterraneo, Italy (CREA-SAM).

In the Abruzzo region, *B. desplatsella* was collected around Scanno, in the locality of Frattura, L'Aquila (41°55.69"N; 13°52.30'E). The site is located at ca. 1200 m a.s.l., on the southern slope of Mount Genzana. The xerothermophilous habitat is composed of pastures and shrubs, with small woods of *Quercus pubescens* Willd. (Fagaceae).

Methods

One specimen of *B. desplatsella* from Calabria and two from Abruzzi were submitted for DNA barcoding (carried out at Zoologische Staatssammlung München, Germany, following the standard protocol; Wilson 2012) in order to confirm their conspecificity and to measure the genetic distance between them. A 658 bp long sequence of the mtCOI gene was obtained (standard for discrimination of species of Lepidoptera, Hebert et al. 2003). The sequences are deposited in the online BOLD database (<http://www.boldsystems.org/>; Ratnasingham and Hebert 2007).

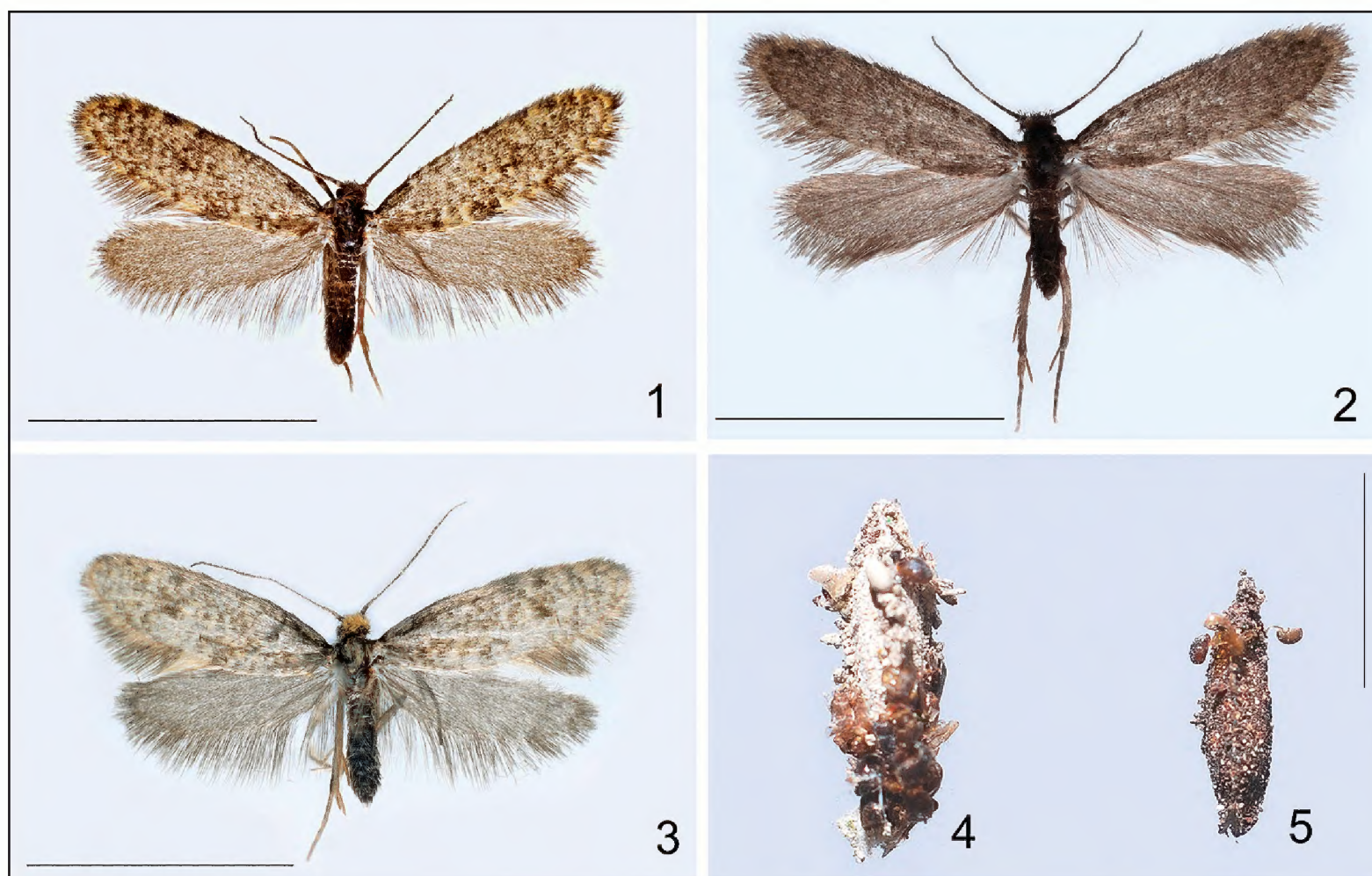
Material. The study was based on 15 males and 1 larval case, herein described for the first time.

Italy: 1 male, Calabria, Cupone, Spezzano della Sila (CS), 1170 m, 12.ix.2013, S. Scalercio leg., slide CREA-0030; 14 males, Abruzzo, Frattura di Scanno (AQ), 1200 m, 30.ix.2014, E. Bertaccini leg.; 1 larval case, Abruzzo, Frattura di Scanno (AQ), 1200 m, 27.ix.2015, E. Bertaccini leg.

Results

Diagnosis of males

As a result of the different phenology of other European *Bankesia* species, *B. desplatsella* can be confused only with *T. defoliella*, as also noted by Nel (1999). Diagnostic features are as follows (Figs 1–3, 6–11): 1) the background colour of the wings is grey in *B. desplatsella* and light-brown in *T. defoliella*, with some individuals of *B. desplatsella* being homogeneously dark-grey (Figs 1–3); 2) the wing shape is more rounded in *T. defoliella* (Figs 1–3); 3) the antennae of *B. desplatsella* are shorter than those of *T. defoliella* (Figs 1–3); 4) the male genitalia are distinct in



Figures 1–5. Comparison of males and larval cases of *Bankesia desplatsella* Nel, 1999 with similar species. **1.** *B. desplatsella*, Frattura di Scanno, Abruzzi. **2.** *B. desplatsella*, idem. **3.** *Taleporia defoliella* Constant 1896, Santa Sofia, Spinello, Romagna, ca. 900 m, 22.ix.2015. **4.** Larval case of *Bankesia conspurcatella*, Frattura di Scanno, Abruzzi. **5.** Candidate larval case of *Bankesia desplatsella*, idem. Scale bar 5 mm.

the shapes of the valvae, saccus and sacculus (Figs 6–9); and 5) the phallus of *B. desplatsella* is enlarged at the apex (Figs 10–11).

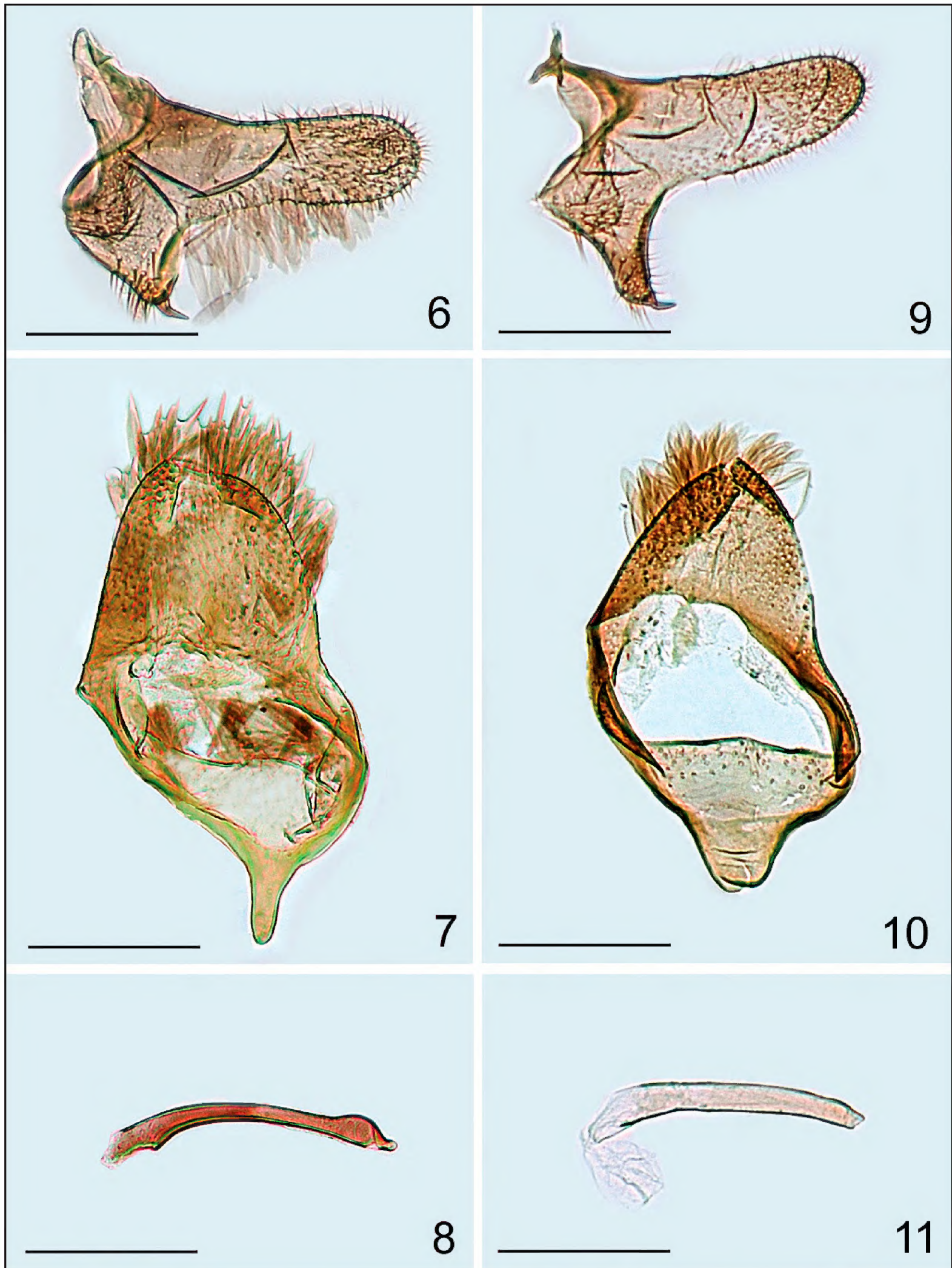
Barcoding

Three complete sequences (658 bp) were obtained from the barcoding analysis of the three specimens. They share the same Barcode Index Number (BIN Registry for BOLD:ACV0613), confirming their conspecificity. The Nearest-Neighbour available in BOLD is an unidentified *Pseudobankesia* Meier, 1963 from Bulgaria (BOLD:ACJ3767) showing a genetic distance of 4.49%. Whilst specimens from Abruzzi have identical sequences (BOLD IDs: BC ZSM Lep 91960, BC ZSM Lep 91961), they showed a difference of 0.92% compared with those from Calabria (BOLD ID: LEP-SS-00171), suggesting a possible genetic isolation between these two populations.

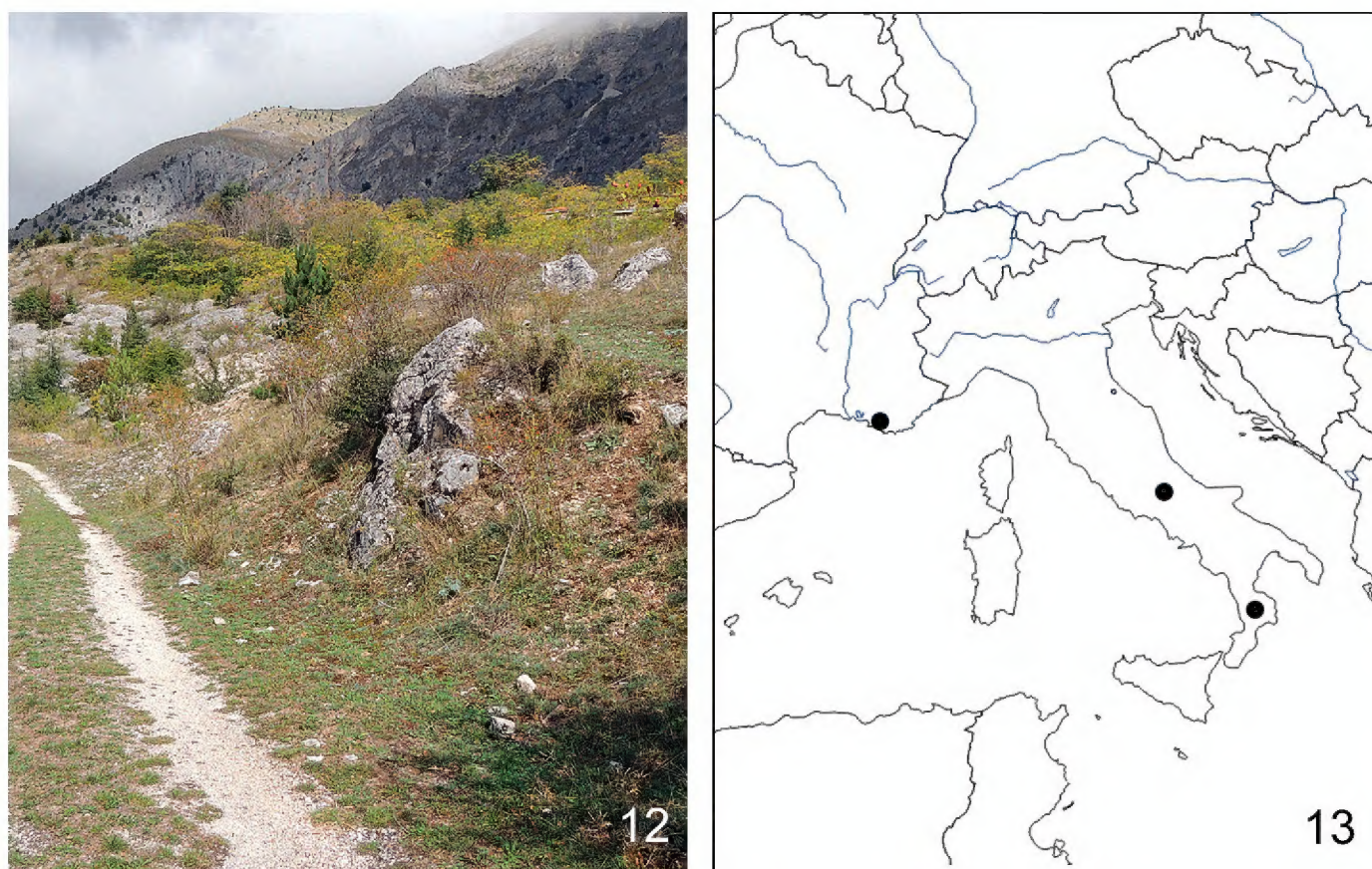
The genetic distance between the Calabrian *B. desplatsella* specimen sequenced in this study and a Calabrian specimen of *T. defoliella* available on BOLD (dataset “DS-PSYFO”, accessed at <http://dx.doi.org/10.5883/DS-PSYFOR>) (Scalercio et al. 2016) was very high (12.5%), definitively excluding conspecificity of these specimens.

Description of the larval case

One larval case, certainly attributable to a *Bankesia* species, was found in the vicinity of Frattura. It was evenly covered by soil particles and decorated with parts of dead insects and it probably



Figures 6–11. Details of male genitalia. *Bankesia desplatsella* (slide: 925 Bertaccini): **6.** valva; **7.** vinculum and saccus; **8.** phallus. *Taleporia defoliella* (slide: 927 Bertaccini): **9.** valva; **10.** vinculum and saccus; **11.** phallus. Scale bar 0.2 mm.



Figures 12–13. Habitat and range of *Bankesia desplatsella*. **12.** Habitat in central Italy, Abruzzi, Frattura di Scanno, L’Aquila, ca. 1200 m. **13.** Known range of *Bankesia desplatsella*.

belongs to *B. desplatsella*. Its specific identity cannot be determined with certainty as it was empty, but it cannot belong to *B. conspurcatella* as it was too small (Figs 4–5). It is certainly a mature case as it was empty and had the anal extremity opened as usually occurs after the extrusion of the mature pupa. Thus, it is a likely candidate for belonging to *B. desplatsella* or, less likely, to an undescribed *Bankesia* species. The case of *Taleporia defoliella* is easily distinguishable because it is not covered by any kind of soil or insect parts.

Ecology

Bankesia desplatsella has been found only in the mountains in Italy, where it was collected at ca. 1200 m a.s.l. in both sites. As such, it contrasts with the type locality, which is at ca. 300 m a.s.l. The habitat varies from a Mediterranean garrigue dominated by *Erica multiflora* L. (Ericaceae) and *Quercus coccifera* L. (Fagaceae) in France (Nel 1999), to a Calabrian black pine forest in southern Italy, to a shrubby rocky slope in central Italy with small *Quercus pubescens* woods (Fig. 12) and it shows significant changes to the previously known range of the species (Fig. 13). Males were collected from mid-September to mid-October. Nothing is known about the biology of this species.

Acknowledgements

We thank Jacques Nel (France: La Ciotat) for his availability and his assistance and to Axel Hausmann (Germany: Zoologische Staatssammlung München) for sequencing specimens from Abruzzi. We also thank Thomas Sobczyk (Germany) and Wilfried Arnscheid (Germany) for their helpful comments on the manuscript, and we are grateful to Malcolm Scoble (UK) for linguistic editing and comments that significantly improved the manuscript. The work was financially supported by the Project “Monitoraggio dei Lepidotteri Notturmi attraverso l’utilizzo di trappole luminose tipo Rothamsted” funded by the Sila National Park authority, Italy.

References

- Arnscheid WR (2016) *Taleporia henderickxi* sp.n., a new psychid species of the subfamily Taleporiinae from Crete (Lepidoptera, Psychidae). *Nota lepidopterologica* 39(2): 93–100.
- Bertaccini E (2010) Altri Psychidi nuovi o poco noti per l'Emilia-Romagna (Insecta Lepidoptera Psychidae). *Quaderno di Studi e Notizie di Storia Naturale della Romagna* 30: 87–101.
- Constant A (1896) Microlépidoptères nouveaux de la faune française. *Annales de la Société entomologique de France, Congrès annuel: L-LIII*.
- Hättenschwiler P, Scalercio S (2003) Systematik, Morphologie und Verbreitung von *Taleporia defoliella* Constant, 1895 comb. Rev. (Psychidae). *Nota lepidopterologica* 26(1/2): 19–25.
- Hebert PDN, Cywinska A, Ball SL, deWaard JR (2003) Biological identification through DNA barcodes. *Proceedings of the Royal Society of London B* 270: 313–321. <https://doi.org/10.1098/rspb.2002.2218>
- Nel J (1999) Espèces nouvelles ou rarement signalées de microlépidoptères de France (Lepidoptera). *Bulletin de la Société entomologique de France* 104(4): 347–355.
- Rebel H (1919) Zur Kenntnis palaearktischer Talaeporiiden. *Deutsche Entomologische Zeitschrift Iris* 32(1918): 95–112.
- Scalercio S (2009) Messa a punto delle conoscenze sugli Psychidae di Calabria, Italia Meridionale (Lepidoptera Tineoidea). *Bollettino della Società entomologia Italiana* 141(3): 163–178.
- Scalercio S, Bonacci T, Turco R, Bernardini V (2016) Relationships between Psychidae communities (Lepidoptera: Tineoidea) and the ecological characteristics of old-growth forests in a beech dominated landscape. *European Journal of Entomology* 113: 113–121. <https://doi.org/10.14411/eje.2016.014>
- Sobczyk T (2011) Psychidae (Lepidoptera). *World Catalogue of Insects*. Vol. 10. Apollo Books, Stenstrup, 467 pp.
- Weidlich M (2015) Beobachtungen zur Psychidenfauna Italiens mit der Neubeschreibung einer *Dahlica* Enderlein, 1912 (Lepidoptera: Psychidae). *Linzer Biologische Beiträge* 47(2): 1909–1934.
- Wilson JJ (2012) DNA barcodes for insects. In: Kress WJ, Erickson DL (Eds) *DNA Barcodes: Methods and Protocols*. Springer, New York, 17–46. https://doi.org/10.1007/978-1-61779-591-6_3
- Zeller PC (1850) Verzeichniss der von Herrn Jos. Mann beobachteten Toscanischen Microlepidoptera. *Stettiner Entomologische Zeitung* 11(2): 59–64.